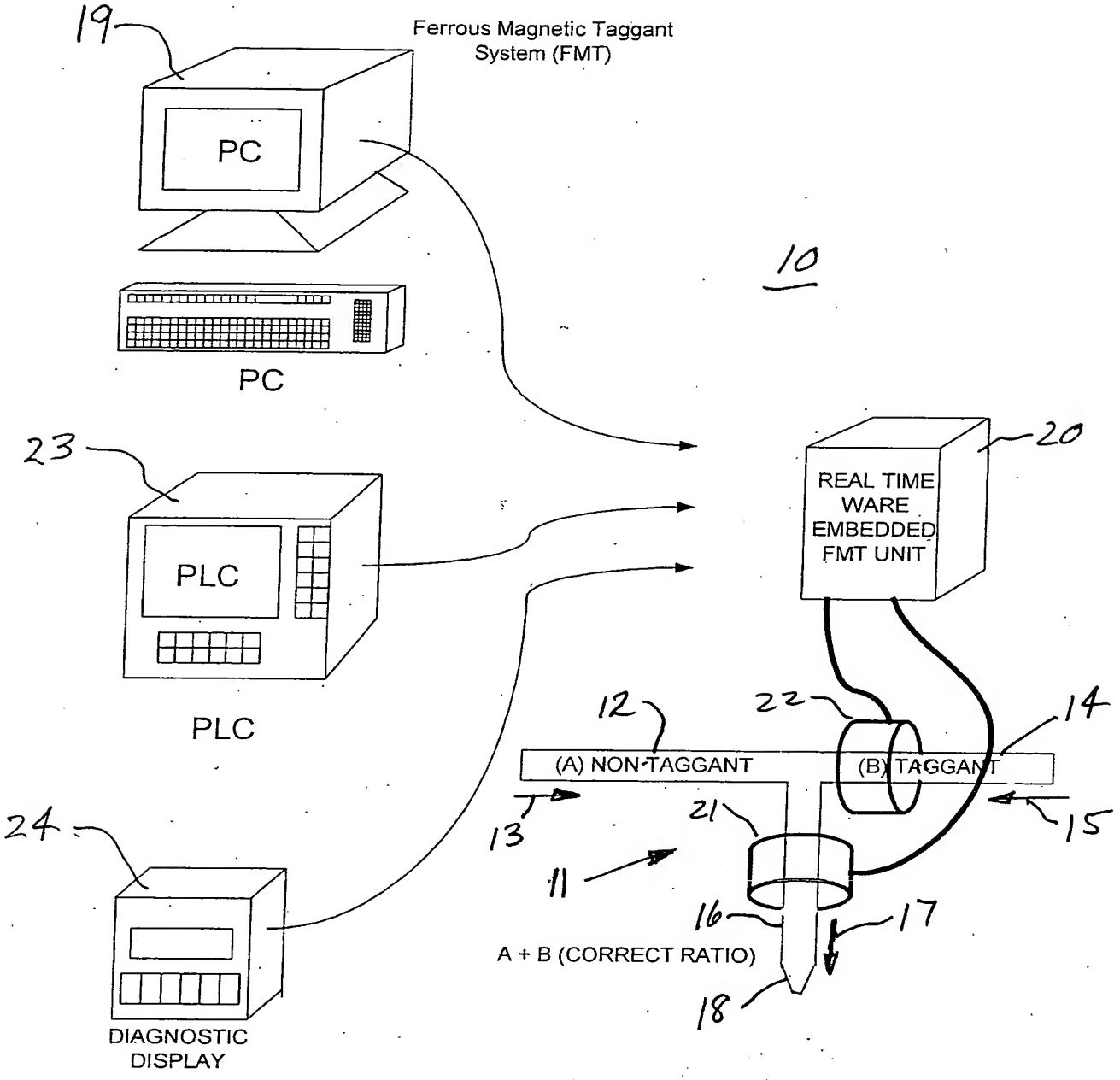

19
Ferrous Magnetic Taggant System (FMT)
PC
PC
10
23
PLC
PLC
20
REAL TIME WARE EMBEDDED FMT UNIT
12
22
14
(A) NON-TAGGANT
(B) TAGGANT
13
15
21
11
24
16
17
A + B (CORRECT RATIO)
18
DIAGNOSTIC DISPLAY

Fig. 1

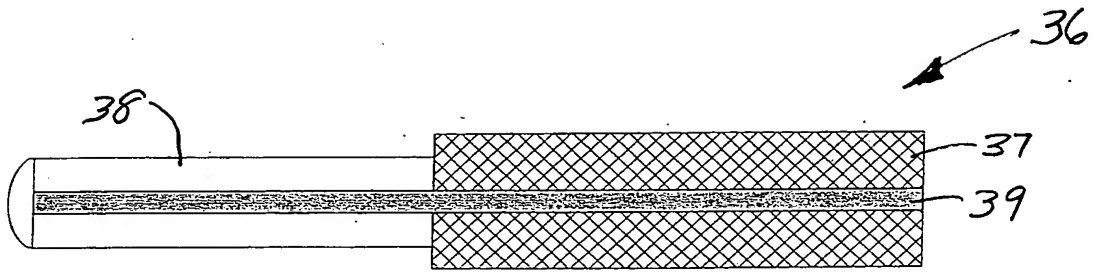


Fig. 7

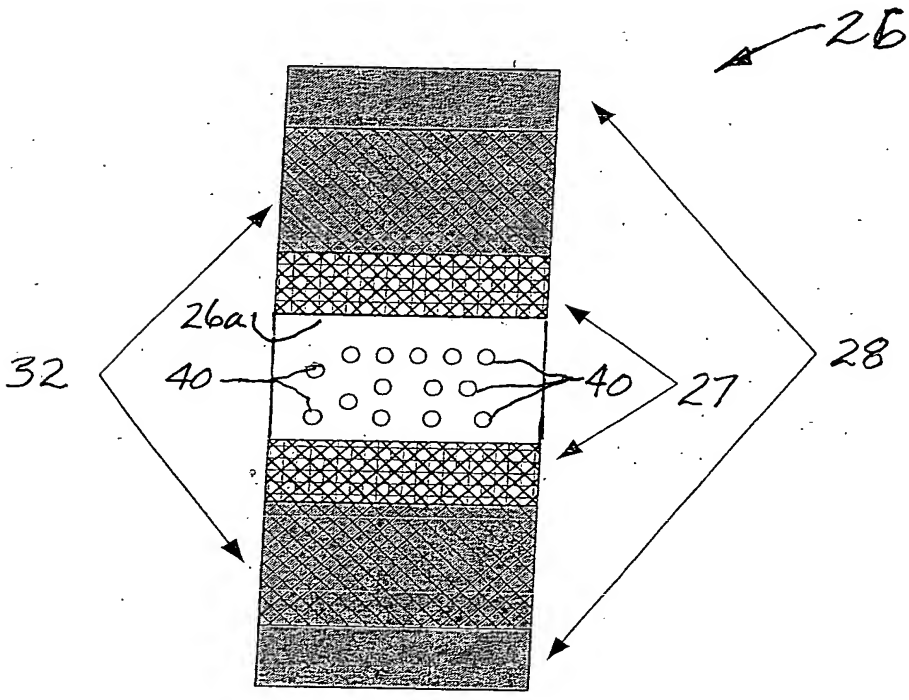


Fig. 2

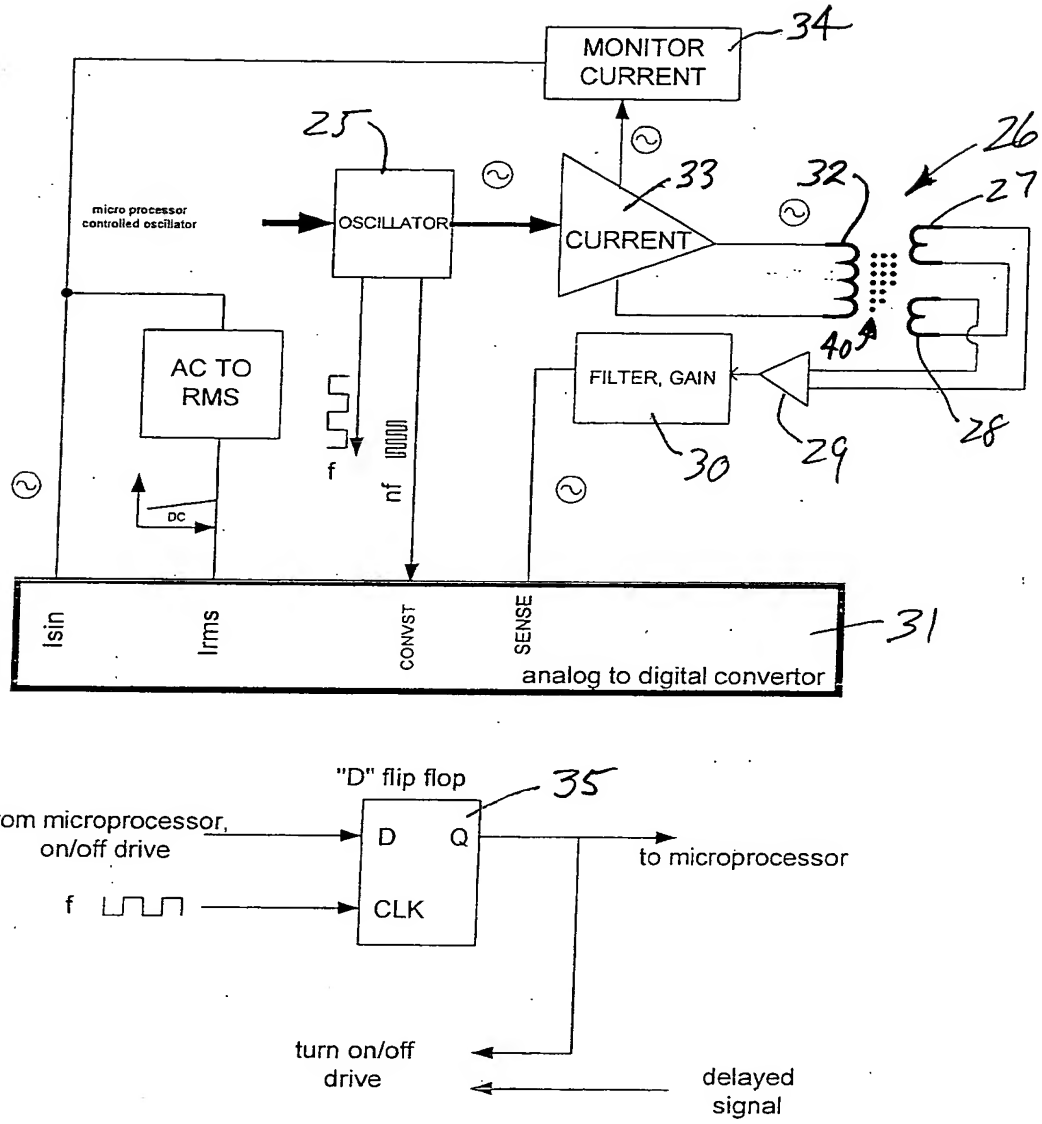
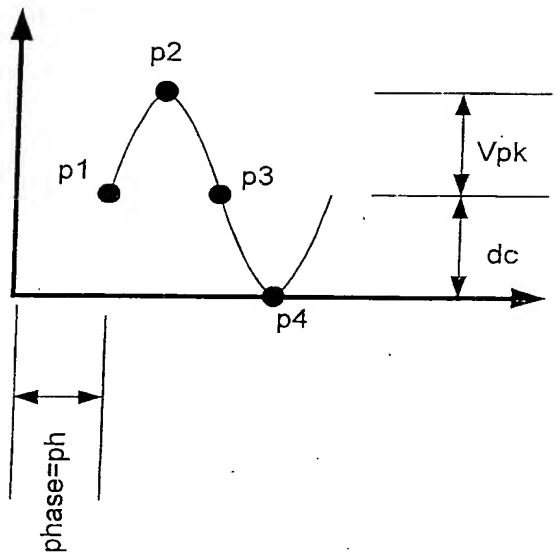

MONITOR CURRENT
34
25
micro processor controlled oscillator
OSCILLATOR
CURRENT
33
32
26
27
AC TO RMS
DC
f
nf
FILTER, GAIN
30
29
28
40
Isin
Irms
CONVST
SENSE
analog to digital convertor
31
"D" flip flop
35
from microprocessor, on/off drive
D
Q
to microprocessor
f
CLK
turn on/off drive
delayed signal

Fig. 3

V(out)= Vpk x sin(ph +2 x pi x f x t) + dc



p1=Vpk x sin(phase) +dc

p2= Vpk x sin(phase +90) + dc =Vpk x cos(phase) + dc

p3= Vpk x sin(phase +180) + dc = -Vpk x sin(phase) + dc

p4= Vpk x sin(phase +270) + dc =-Vpk x cos(phase) + dc

p1-p3=2 x Vpk x sin(phase)

p2-p4=2 x Vpk x cos(phase)

phase=atan(p1-p3)/(p2-p4)

Vpk=(p1-p3)/sin(phase)

Fig. 4

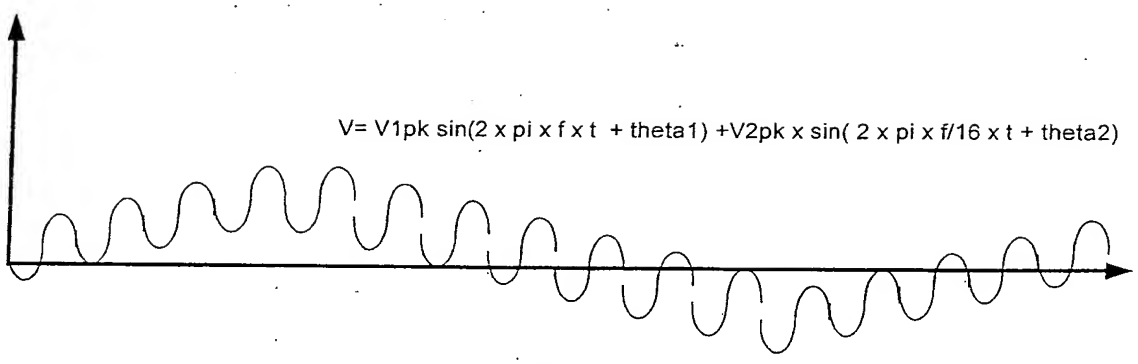

V= V1pk sin(2 x pi x f x t + theta1) +V2pk x sin(2 x pi x f/16 x t + theta2)

Fig. 5

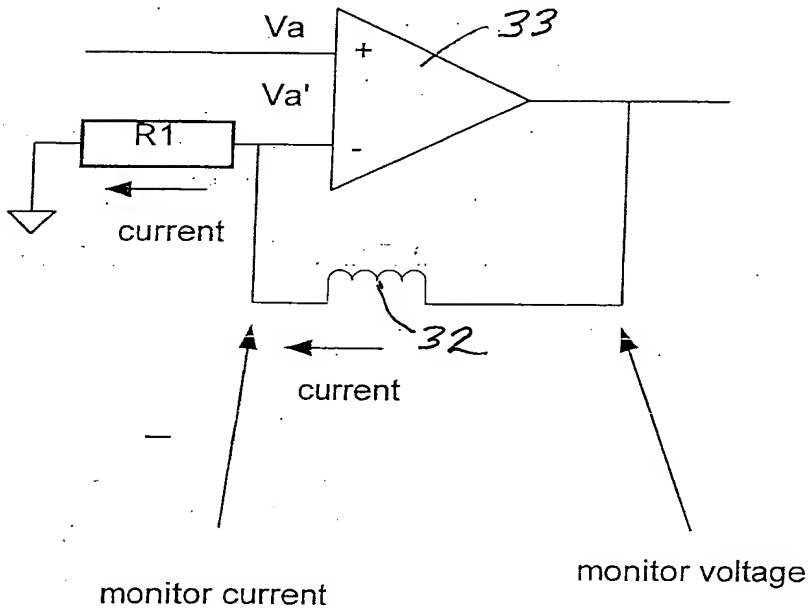

Va
Va'
R1
current
33
+
-
32
current
monitor current
monitor voltage

Fig. 6